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THE BOLOMETRIC WAY TOWARDS THE DIRECT DARK MATTER DETECTION: THE EDELWEISS EXPERIMENT AND THE EURECA PROSPECT

Within the current cosmological concordance model, a large fraction of the mass in the universe is made of dark matter. One tool to detect dark matter in the form of WIMP is given by the direct detection. The EDELWEISS experiment, operated in the Frejus laboratory in a low-background environment, uses cryogenic germanium detectors to look for a direct search of WIMP. These detectors are subject to constant improvement with respect to the rejection capabilities against non WIMP interactions. We present here the results of a WIMP search carried out with ten so-called InterDigit detectors, technology that enables a high level of gamma radioactivity rejection within a controlled fiducial volume. A cross-section of $4.4 \cdot 10^{-8}$ pb could be excluded for a WIMP mass of 85 GeV. We also report the search for low-energy WIMP-induced nuclear recoils for an exposure of 113 kg \cdot d. The status of the EDELWEISS-III project, which will operate 40 newly-designed FID detectors in an upgraded installation, will be given as well as a short presentation of the EURECA project aiming to a cross-section of 10^{-10} - 10^{-11} pb.

Keywords: dark matter, WIMP searches, cryogenic Ge detectors, the EDELWEISS experiment.